Information Development and Delivery for Conservation of Sensitive Ecosystems within the James River Basin

Final Report

June 2003

EPA Doc ID: 98719101

MU Proposal #: 02119081

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Introduction and goals

The James River Basin watershed of southwest Missouri includes most of the cities of Springfield, Nixa, and Ozark, the most rapidly growing urban area in Missouri (Figure 1). The beauty of the Ozarks has attracted newcomers to the region, but the increasing population is threatening environmental quality. Significant water quality issues related to the James River itself, and to Table Rock Lake, have been highly publicized. In addition, the James River is on the EPA 303(d) list of impaired streams. Relevant information is necessary for sound resource management decisions and public education. The primary goals of this project were to:

(1) Identify the primary needs of the James River Basin Partnership (JRBP) and its constituents.
(2) Identify the location and extent of sensitive and representative ecosystems in the James River Basin watershed using the most recent GIS data available.
(3) Organize, interpret, and deliver the results in highly accessible forms to citizens and decision-makers in the James River Basin watershed.

The resultant data and analyses will be delivered for use by the JRBP along with other area groups or organizations, who will in turn disseminate the information to private citizens and local governments so they may make more sound planning and zoning decisions.

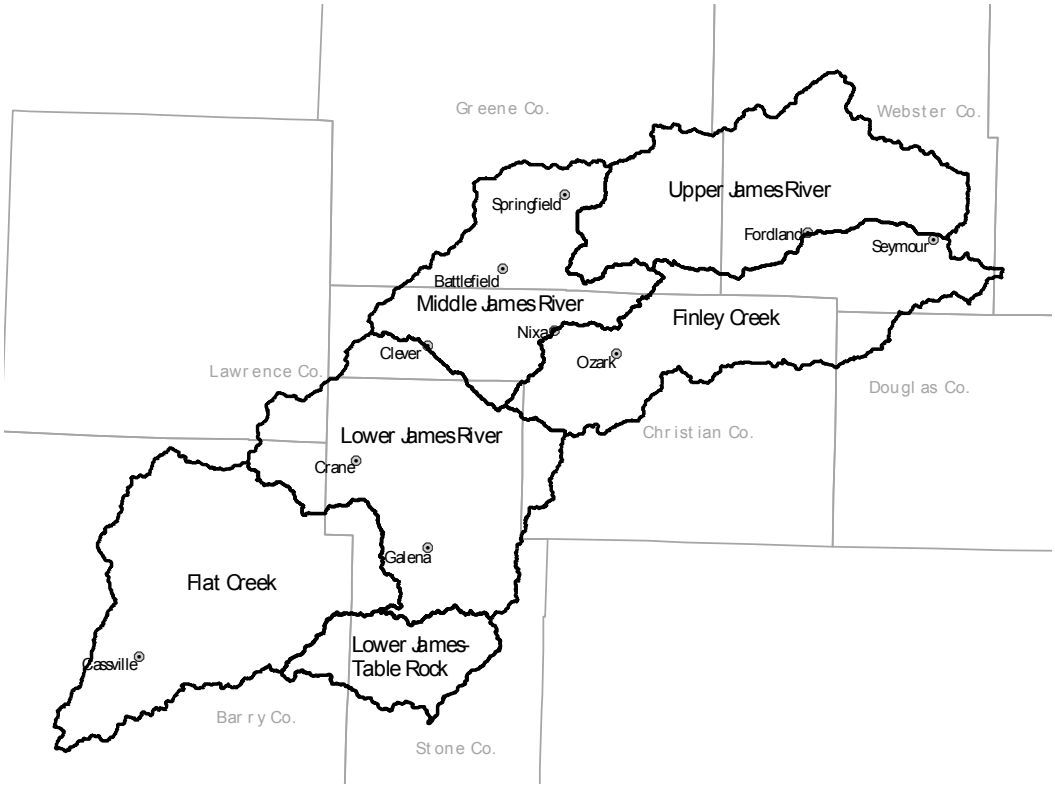


Figure 1. James River Basin with 10-digit hydrologic units.

Identification of data needs

JRBP and various groups in the basin were consulted at the beginning of the project in order toidentify deliver information specifically useful to those entities. The meetings with these groups allowed MoRAP to develop an understanding of some of the major concerns and priorities in the watershed, solicit input on information needs and product delivery, and further refine the project's objectives. (See Appendix A, B, and C for complete meeting notes and lists of attendees). In September 2002 a meeting was held in Springfield, Missouri, with representatives from MoRAP, Environmental Protection Agency Region 7, JRBP, Natural Resource Conservation Service, Greene County, City of Springfield, and Wilson's Creek National Battlefield (Appendix B). From this meeting four primary objectives were identified and refined. The final objectives of this project focused on:

(1) Urban development. Deliver results from urban remote sensing project on land use change in the Springfield area.
(2) Conservation opportunity areas. Develop forest, grassland, and mosaic opportunity areas using 2001 MoRAP land cover and 2000 TIGER Census data.
(3) Agricultural resources. Identify agricultural resources in the basin, including current agricultural land that is designated by the NRCS as prime farmland or statewide important farmland.
(4) Agricultural change. Evaluate the change in agricultural land that was designated as prime or statewide important farmland for the Springfield, Missouri, area from 1972 to 2000.
(5) Outreach. Develop a first-draft of the James River Canoe Guide to JRBP.

Urban development

Urban development was identified as a major concern in the basin. Urbanization often leads to increased expanses of impervious surfaces and reflects increased human populations. In addition to the loss of green space, areas that are highly suitable for agricultural production are converted to urban land uses. To evaluate the changes in the Springfield urban landscape it is important to (1) understand how the urban landscape has expanded throughout the years and (2) identify what land uses currently face urbanization.

The results presented in the report are summarized from a previous study entitled "Urban Remote Sensing for Land Use Change and Impacts" (Diamond and Blodgett 2003). The purpose of that study was to evaluate trends in urbanization from 1972 to 2000 for four major U.S. cities in EPA Region 7 (Omaha, Nebraska; Kansas City, Missouri; St. Louis, Missouri; and Springfield, Missouri) Satellite imagery from 1972, 1979, 1984, 1988, 1992, and 2000 were classified to evaluate urban change over time. (For a complete review of methodology and processing see Diamond and Blodgett 2003).

The urban landscape in and around the Springfield metropolitan area has changed dramatically from 1972 to 2000 (Figure 2). The acres of urban land cover in Springfield increased from 36,996 acres in 1972 to 103,567 acres in 2000 (Table 1). Springfield experienced a 279.9% increase in urban land cover, the largest percentage for any land use class in the Springfield metropolitan area (Table 2). Grassland was the primary land use converted to urban in the 28 years with a 40% loss. From 1972 to 2000 forested land cover slowly increased in area converted on to urban with approximately 20% of forest lost.

Table 1. Acres of land cover 1972-2000.

	Water	Forest	Urban	Grassland	Cropland	Bare/Sparsely Veg.
October 4, 1972	3,071	58,877	36,996	118,064	20,126	578
September 7, 1979	4,199	58,315	56,924	99,062	18,728	483
September 18, 1984	4,907	48,079	72,384	101,933	9,607	800
September 13, 1988	8,433	43,082	85,047	91,647	9,502	800
September 24, 1992	8,483	42,531	92,063	81,567	13,009	56
September 6, 2000	8,896	37,456	103,567	75,268	12,246	278

Table 2. Acres of land cover lost or added 1972-2000.

	Lost			Added
	Forest	**Grassland**	**Cropland**	**Urban**
1972-1979	2,712	15,169	1,873	19,928
1979-1984	2,283	10,938	1,965	15,460
1984-1988	1,553	9,986	859	12,663
1988-1992	1,256	5,466	295	7,016
1992-2000	4,350	6,133	1,004	11,504
Total	12,154	47,692	5,996	66,571
Total %	20.6%	40.4%	29.8%	279.9%

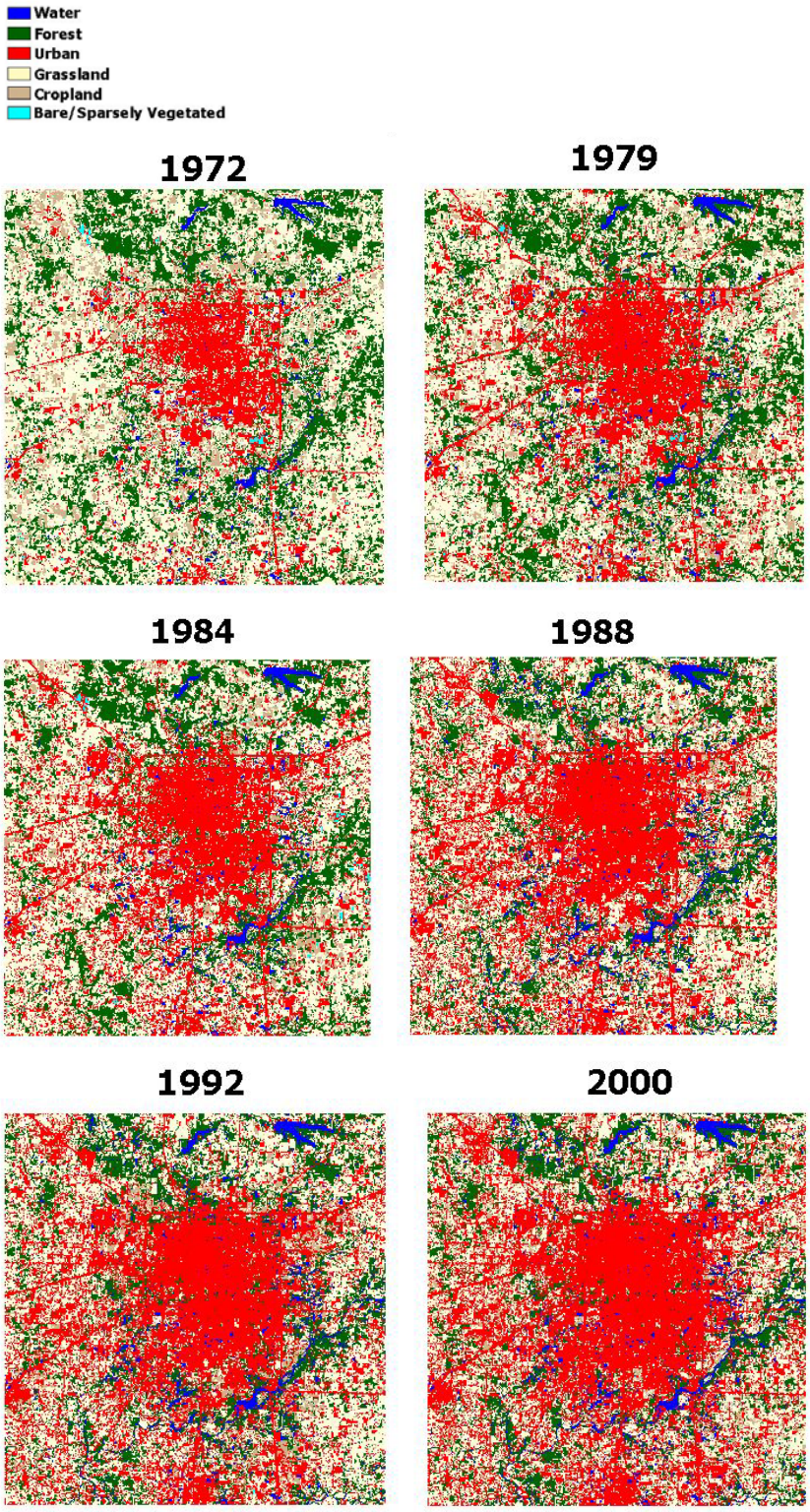


Figure 2. Land use change in Springfield, Missouri - 1972 to 2000.

Conservation opportunity areas

Development of opportunity areas

Conservation opportunity areas (OAs) are defined as natural and semi-natural land cover patches that are away from roads and away from patch edges (Diamond et al. 2003). The OAs were modeled by creating distance grids using the 2001 MoRAP draft land cover and the 2000 Census Bureau's TIGER road files. The land cover and road distance grids were joined to identify areas far from roads and far from patch edges. (For a detailed explanation of methodology see Diamond et al. 2001.) The draft 2000-2001 land cover consisted of 15 vegetation / land use classes that were condensed into 5 main categories: urban, cropland, grassland, forest, and water (Table 3 and Figure 3).

Table 3. Draft 2000-2001 land cover classes.

Condensed classes	Original classes
Urban	
	Impervious
	High intensity urban
	Low intensity urban
	Barren or sparsely vegetated
Cropland	
	Cropland
Grassland	
	Grassland
	Herbaceous-dominated wetland
Forest and woodland	
	Deciduous forest
	Evergreen forest
	Mixed forest
	Deciduous woody/herbaceous
	Evergreen woody/herbaceous
	Mixed woody/herbaceous
	Woody-dominated wetland
Water	
	Open water

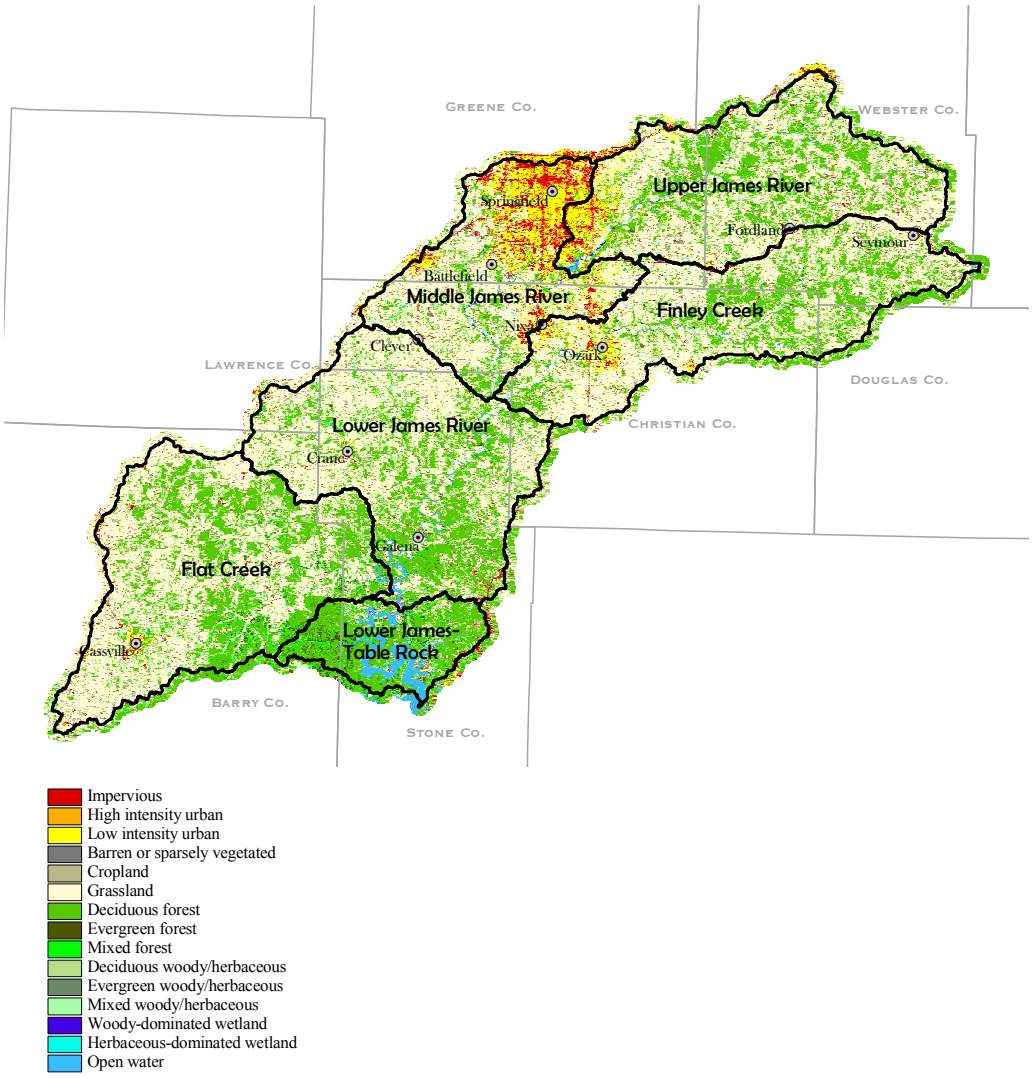


Figure 3. Draft 2000-2001 land cover.

Forest OAs were composed of seven forest and woody classes while grassland OAs were composed of two grass and herbaceous classes. The 'mosaic' land cover class was designed to recognize areas where small patches of forest and grassland are interspersed. Although there are various distances from patch edges that can be used, this study examined OAs that are at least 75 meters away from any road and 75 meters into the interior of a land cover patch.

The largest and greatest quantities of forest, grassland, and mosaic OAs are located away from urban areas (Figure 4). There are 120,667 acres of forest OAs in the entire James River Basin, comprising 13% of the watershed (Table 4). Mosaic OAs comprise the greatest amount of the watershed at 33%. This may be due to the fragmented nature of the landscape where much of the remaining forest and grassland is in small, interspersed patches rather than homogeneous, contiguous patches. The Lower James-Table Rock subbasin contains the greatest percent (46%) of opportunities for conservation of forested land.

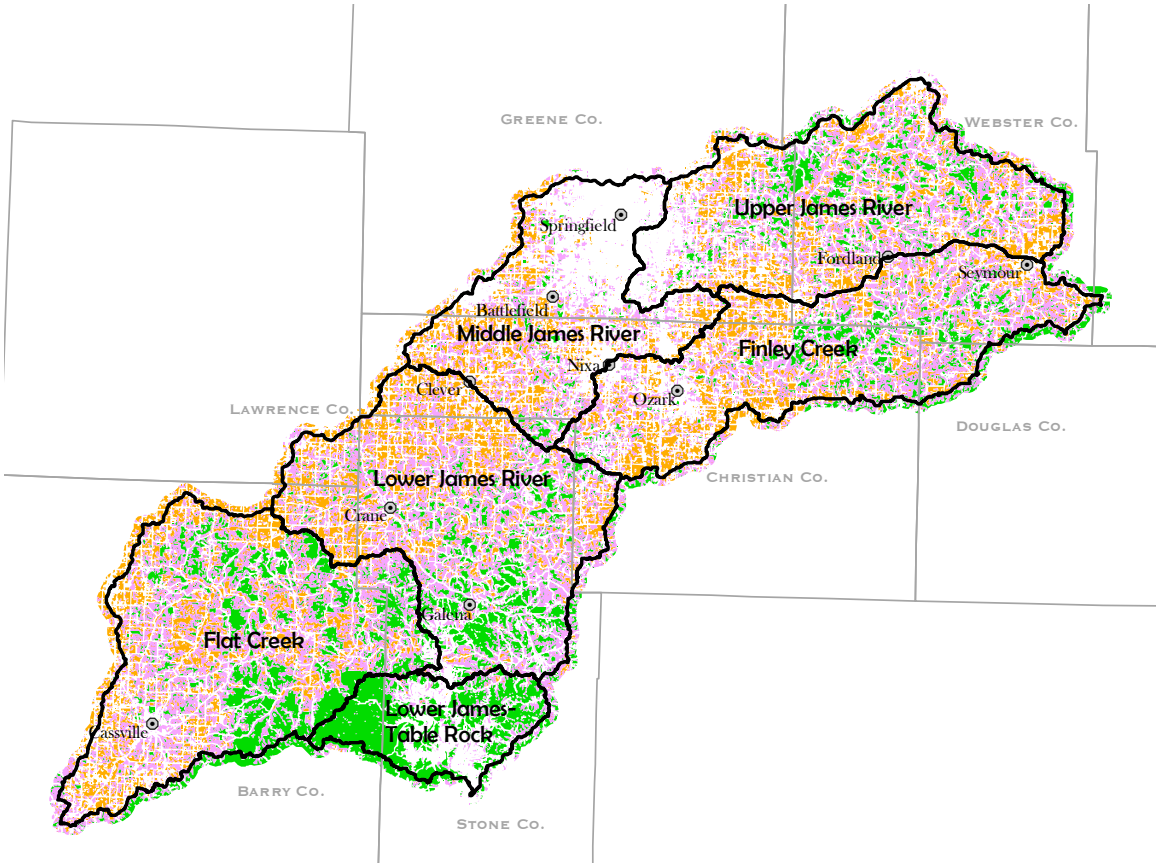


Figure 4. James River Basin forest (green), grassland (orange), and mosaic (pink) conservation opportunity areas.

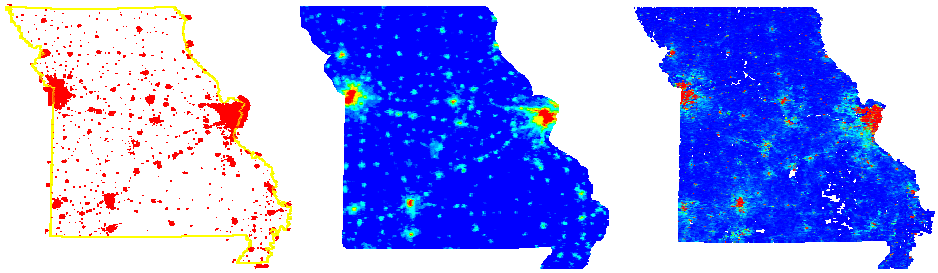
Table 4. Acres and percent of conservation opportunity areas by 10-digit hydrologic unit.

	Forest		**Grassland**		**Mosaic**	
	Acres	%	Acres	%	Acres	%
Upper James River	17,768.07	10.33	25,810.14	15.00	57,630.14	33.49
Middle James River	3,394.56	2.63	18,476.61	14.31	28,527.52	22.10
Finley Creek	14,739.12	8.56	31,786.43	18.46	61,004.25	35.43
Lower James River	22,911.51	11.79	33,041.15	17.00	74,797.54	38.48
Flat Creek	36,670.55	17.58	31,420.82	15.07	80,731.35	38.71
Lower James-Table Rock	25,183.89	46.28	149.89	0.28	7,273.26	13.37
Total James River Basin	120,667.70	12.97	140,685.04	15.12	309,964.06	33.30

OAs surrounding urban areas

As road density increases and forest or grassland patches become smaller, the opportunities for conservation in areas surrounding urban centers become increasingly limited. OAs close to urban areas, threatened by expansion of roads and impervious surfaces, were identified throughout the basin. Urban areas were defined by using population data and lights-at-night imagery. The 2000 census blockgroups identified regions with large populations. These data were combined with a satellite image composite of lights at night (Figure 5) to identify areas of high urbanization. Two buffers, one-half mile and one mile, were applied to all urban areas in the basin (Figure 6). Once the urban areas were buffered OAs were intersected with the buffered regions.

There are 120,668 acres of forest OAs with 17% of those within one mile and 7% within half a mile of an urban area (Figure 7). Thirty four percent of all grassland OAs in the basin are within one mile of an urban area and 16% are within a half-mile. Mosaic OAs follow the same trends as forest and grass OAs. The OAs that are close to urban areas face different challenges for conservation than OAs that are away from urbanization. These OAs closest to existing urban areas represent potential habitats for more immediate conservation efforts.



(a) (b) (c)

Figure 5. The urban mask (a), created from lights-at-night imagery (b) and U.S. Census population density data by block group (c).

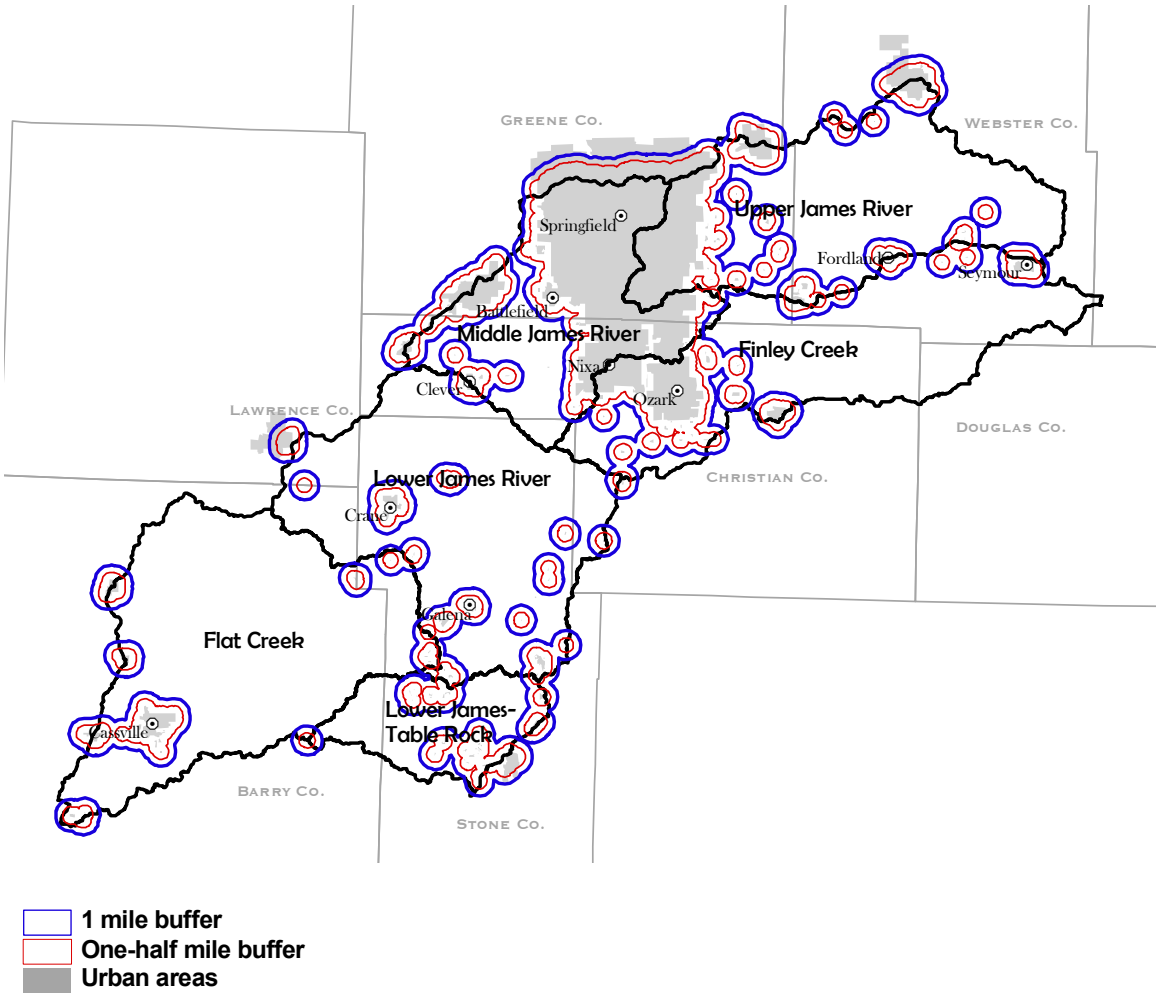


Figure 6. One-half and one mile buffer surrounding urban areas.

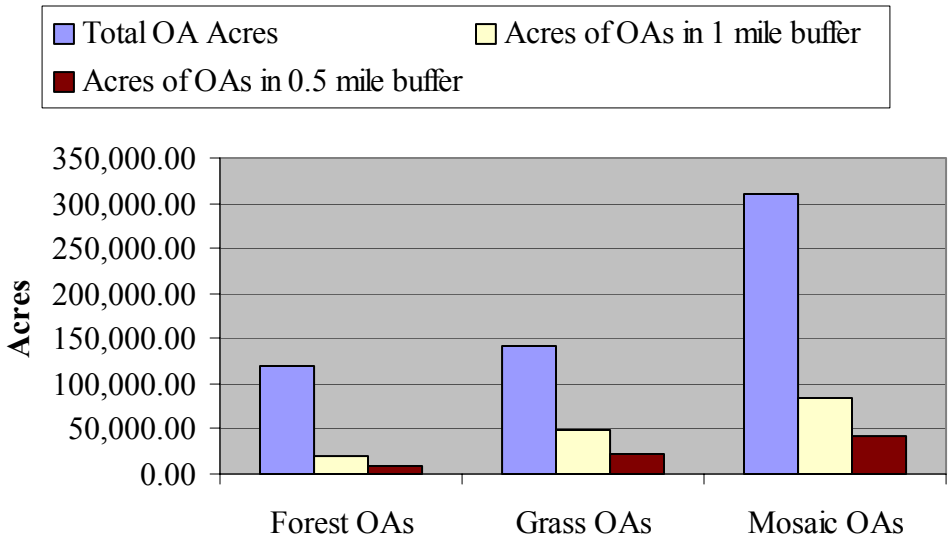


Figure 7. OAs within one and one-half mile buffer.

Agricultural resources

Prime and statewide important farmland

The Natural Resource Conservation Service (NRCS) defines Prime Farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agriculture crops with minimum inputs of fuel, fertilizer, pesticides, and labor…[without] excessive soils erosion…" and Statewide Important Farmland as "land other than prime farmland that is determined to be important by the appropriate State...agencies…" (NRCS Manual 440: Conservation Programs, Part 523 Farmland Protection Policy Act, Subpart C Important Farmland Soils).

Version two of Missouri's state Soil Survey Geographic (SSURGO) Data Base was used to identify soils within the basin classified as providing prime and statewide important farmland (Figure 8). At least 38%, or 353,779 acres, of the James River Basin has soils designated as statewide important farmland. There are 440,327 acres, or 47%, of the basin that is not prime farmland. The Upper James has the greatest amount of soils listed as statewide important with 47.7% (Table 5) and the Middle James subbasin has the highest percentage of prime farmland with 28.1% (however, not all of these areas currently support cropland or grassland uses). In contrast, the Lower James-Table Rock subbasin has 95.9% of its soils listed as not prime farmland.

The 2001 land cover dataset was used to identify current areas of cropland and grassland. These two datasets (SSURGO and land cover) were combined to create a data layer that identified prime and statewide important farmland that is currently in cropland and grassland (Figure 9). As can be seen, the Upper James River subbasin contains the most cropland on prime and statewide important soils and the Finley Creek subbasin contains the most grassland on prime and statewide important soils. The Upper James basin also has the highest percent of cropland (1%) and grassland (28.6%) on soils identified as statewide important farmland (Tables 6 and 7).

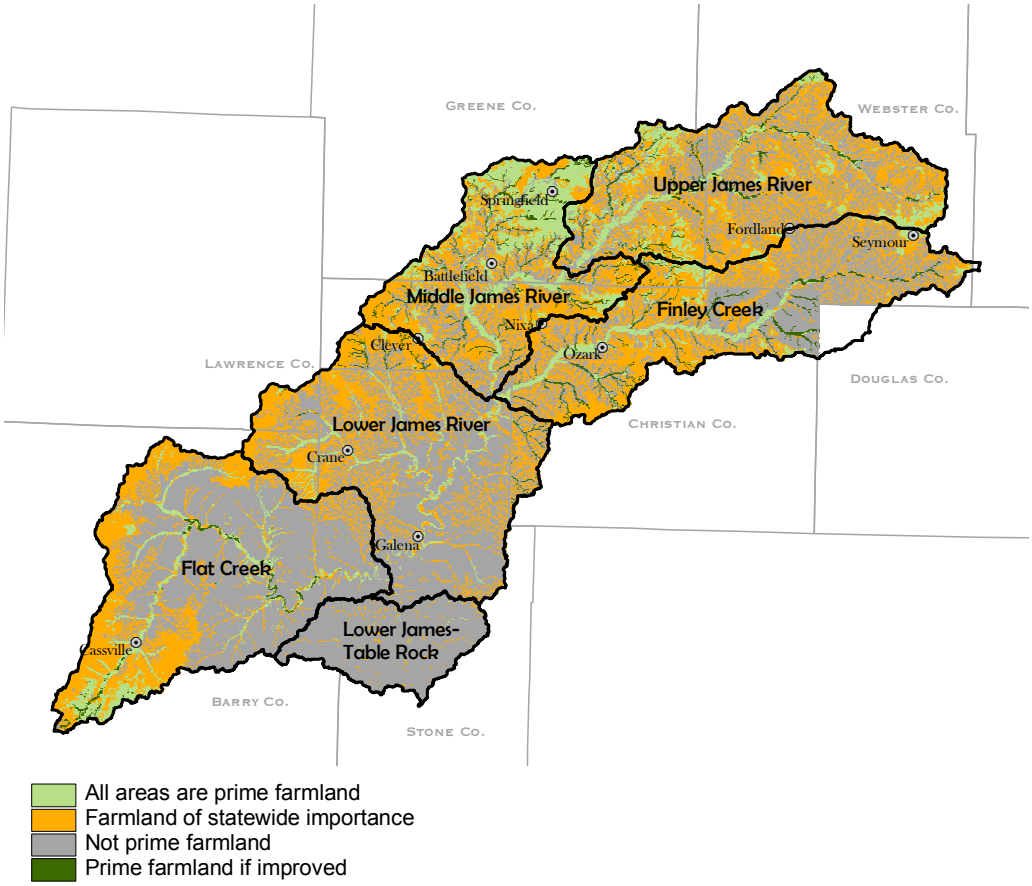


Figure 8. SSURGO soils ranking for prime or statewide important farmland.

Table 5. Acres and percent of SSURGO soils designated as prime or statewide important.

	Farmland of statewide importance		All areas are prime farmland		Not prime farmland		Prime farmland if improved	
	Acres	%	Acres	%	Acres	%	Acres	%
Upper James River	82,105.50	47.7	25,764.10	15.0	58,877.09	34.2	5,385.62	3.1
Middle James River	56,798.18	44.0	36,232.89	28.1	29,034.35	22.5	7,074.67	5.5
Finley Creek	74,751.06	43.4	15,096.95	8.8	66,920.04	38.9	6,607.65	3.8
Lower James River	73,538.37	37.8	9,516.51	4.9	109,356.06	56.3	2,052.21	1.1
Flat Creek	64,431.28	30.9	17,824.11	8.5	123,964.19	59.4	2,433.17	1.2
Lower James-Table Rock	2,154.74	4.0	109.19	0.2	52,175.36	95.9	0.00	0.0

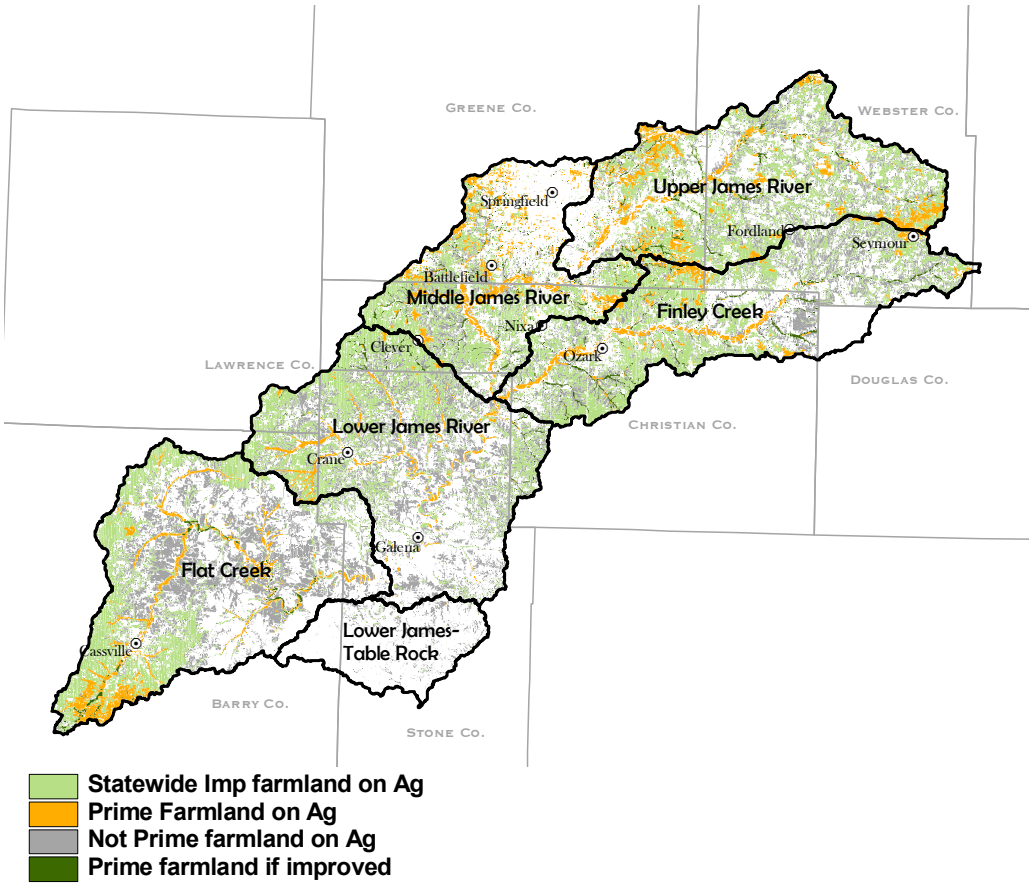


Figure 9. SSURGO soils ranking for prime or statewide important farmland that currently support cropland or grassland land covers.

Table 6. Acres and percent of SSURGO soils designated as prime or statewide important that currently support cropland.

	Farmland of statewide importance		All areas are prime farmland		Not prime farmland		Prime farmland if improved	
	Acres	%	Acres	%	Acres	%	Acres	%
Upper James River	1,765.33	1.0	1,064.80	0.6	400.30	0.2	103.19	0.1
Middle James River	1,278.96	1.0	628.70	0.5	344.04	0.3	56.04	0.0
Finley Creek	1,071.25	0.6	327.14	0.2	347.60	0.2	58.93	0.0
Lower James River	1,552.95	0.8	91.40	0.0	497.26	0.3	54.04	0.0
Flat Creek	1,198.24	0.6	623.36	0.3	265.76	0.1	58.93	0.0
Lower James-Table Rock	0.67	0.0	0.00	0.0	10.45	0.0	0.00	0.0
Total Basin	6,867.40	0.7	2,735.40	0.3	1,865.41	0.2	331.14	0.0

Table 7. Acres and percent of SSURGO soils designated as prime or statewide important that currently support grassland.

	Farmland of statewide importance		All areas are prime farmland		Not prime farmland		Prime farmland if improved	
	Acres	%	Acres	%	Acres	%	Acres	%
Upper James River	49,178.21	28.6	16,660.79	9.7	22,826.33	13.3	3,141.04	1.8
Middle James River	33,426.11	25.9	13,321.83	10.3	14,442.23	11.2	3,242.22	2.5
Finley Creek	52,198.71	30.3	9,919.48	5.8	31,620.30	18.4	4,220.96	2.5
Lower James River	52,838.75	27.2	6,558.73	3.4	47,720.89	24.5	1,465.55	0.8
Flat Creek	45,055.32	21.6	13,407.23	6.4	49,124.17	23.6	1,809.81	0.9
Lower James-Table Rock	356.94	0.7	28.24	0.1	4,056.84	7.5	0.00	0.0
Total Basin	233,054.05	25.0	59,896.30	6.4	169,790.76	18.2	13,879.58	1.5

Each of these subbasins faces the issue of urban growth and encroachment onto current cropland and grassland areas. This issue is most prevalent, however, in the Upper James River subbasin that contains the urban area of Springfield, Ozark, and Nixa. For this area it is important to identify current areas of cropland and grassland on prime and statewide important soils for potential conservation.

Agriculture surrounding urban areas

The buffered urban areas previously discussed were intersected with prime or statewide important agricultural land. The one-half mile and one mile buffers highlight areas where grassland or cropland may be threatened by future urban expansion. While 233,054 acres of statewide important soils with grassland land cover exist in the region, 35% is within one mile of an urban area (Figure 10). At least 40% of the prime or prime if improved soils with grassland land cover lies within a mile of an urban area. Although there is less cropland over statewide significant soils in the basin, much of it also occurs relatively

close to urban areas (Figure 11). Of 6,867 acres, 35.2% lie within a mile of urban areas and 15% within a half mile.

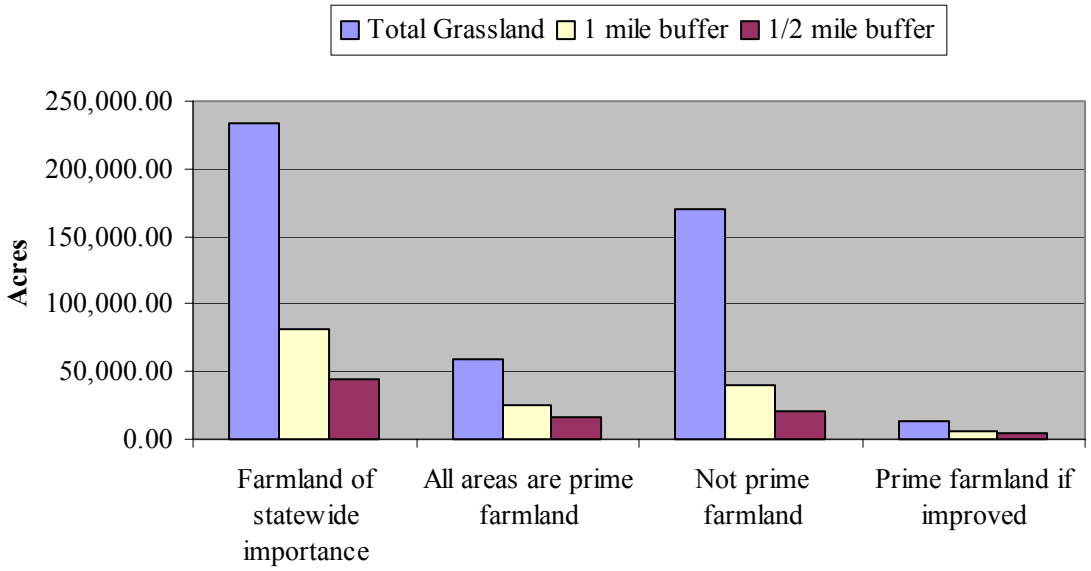


Figure 10. Acres of grassland within basin, 1 mile, and one-half mile buffer.

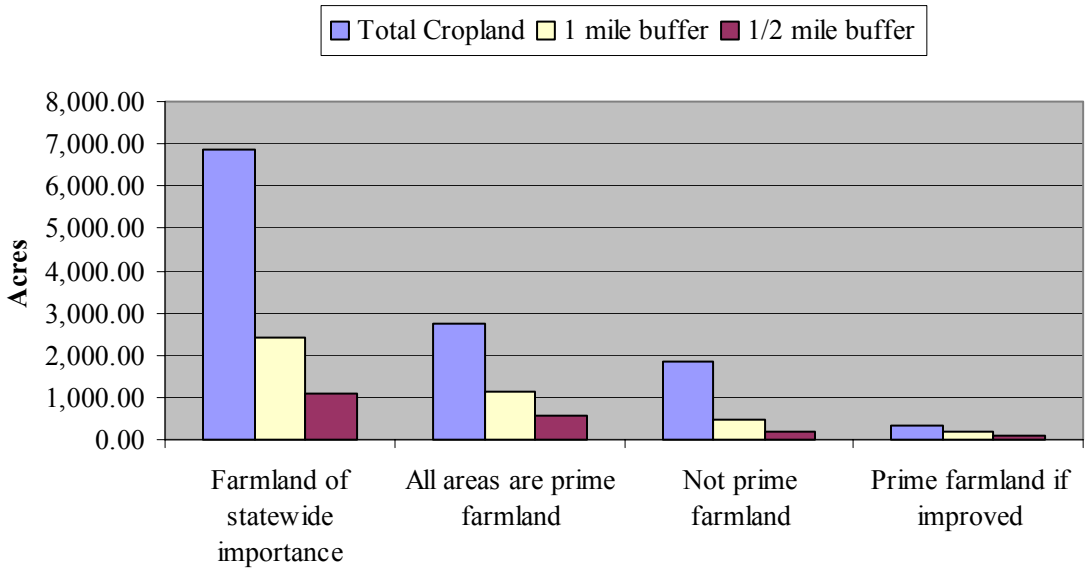


Figure 11. Acres of cropland within basin, 1 mile, and one-half mile buffer.

Agricultural change in the Springfield area

Changes in the amount of grassland and cropland were evaluated from 1972 to 2000. This analysis was conducted using the classified imagery previously used for the urban change analysis in the Springfield area.

A total of 42,841 acres of grassland, or 36%, was lost from 1972 to 2000. The greatest loss occurred from 1972 to 1979 when grass decreased by 16% (Figure 12). A total of 7,885 acres of cropland was lost from 1972 to 2000, a 39% decrease. Cropland decreased the greatest from 1979 to 1984 when 49% was lost (Figure 13). In addition to the declining acres of crop and grass, the size and density of the patches changed. FRAGSTATS, a landscape analysis software (McGarigal and Marks 1995), was used to calculate crop and grass patch size and density. From 1972 to 2000 the mean patch size of grass and crop decreased while patch density increased (Figures 14 and 15). This indicates that agricultural patches were becoming more fragmented and interspersed with other types of land uses.

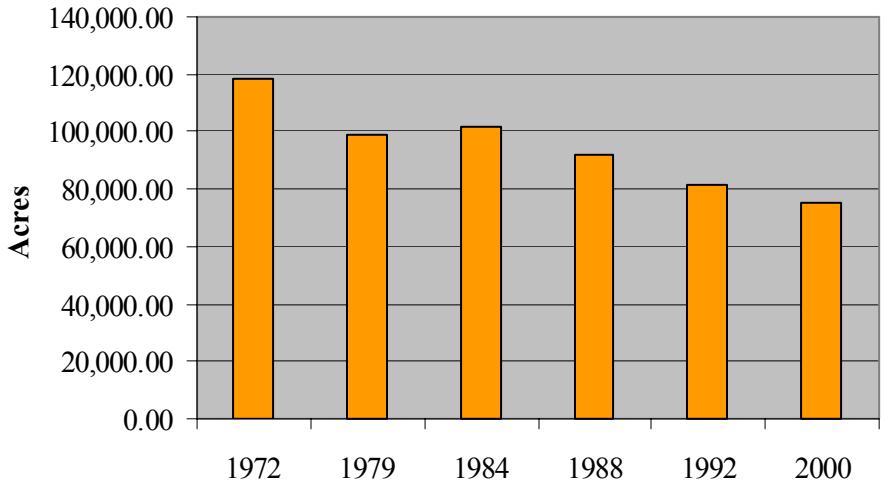


Figure 12. Change in acres of grassland from 1972 to 2000 in the Springfield area.

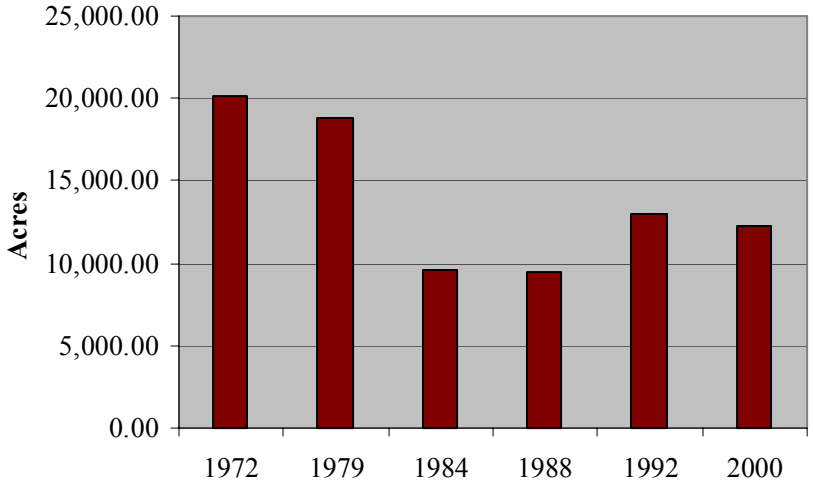


Figure 13. Change in acres of cropland from 1972 to 2000 in the Springfield area.

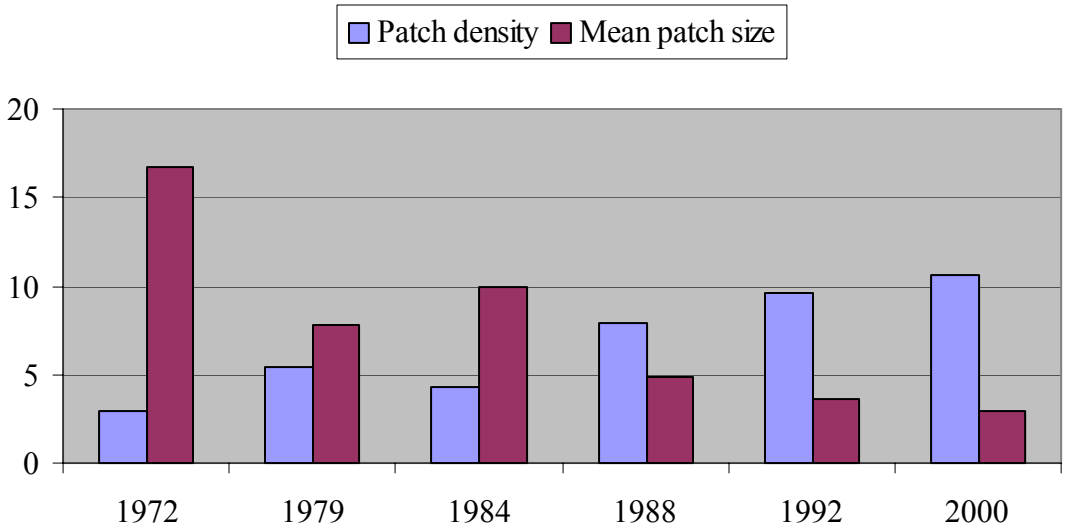


Figure 14. Change in fragmentation of grassland from 1972 to 2000 in the Springfield area.

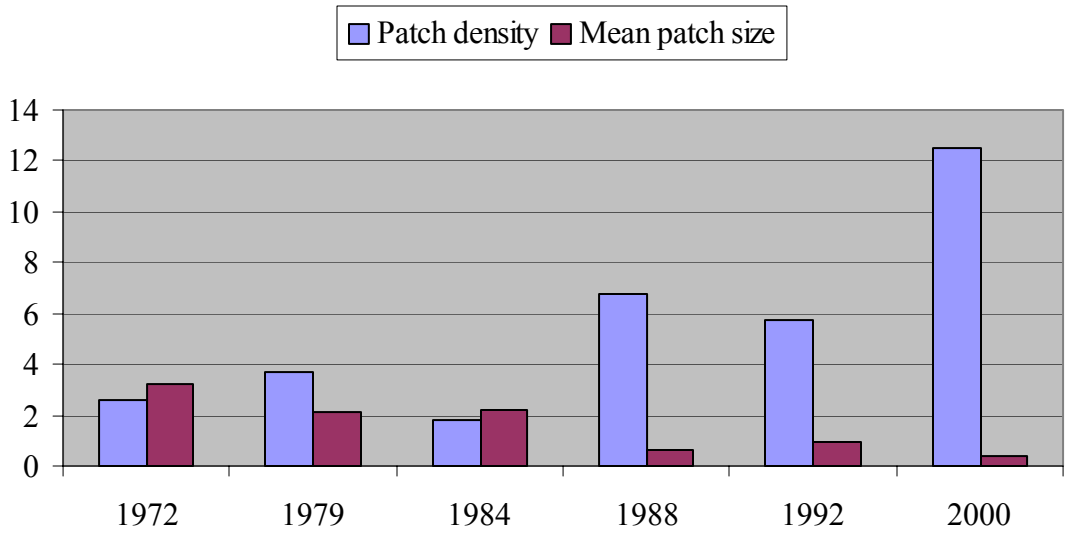


Figure 15. Change in fragmentation of cropland from 1972 to 2000 in the Springfield area.

Change in prime and statewide important agriculture 1972 - 2000 in the Springfield area

Not only is it important to understand how much agricultural land has decreased in the last 28 years but also how much of that land was designated as prime or statewide important farmland. The SSURGO soils were intersected with each of the Springfield scenes from 1972 to 2000. The area of analysis was limited to the SSURGO data within the basin and the satellite imagery within the Springfield urban area. The amount of prime agricultural (crop and grass) land was calculated for each of the six time steps; 1972 (Figure 16), 1979, 1984, 1988, 1992, and 2000 (Figure 17). As seen with Figure 18, the total acres of grassland decreased from 1972 to 2000 for all soil designations. Statewide important soils with grasslands decreased from 35,254 acres to 21,218 acres. Cropland showed similar patterns of decline (Figure 19). Statewide important soils with cropland decreased from 4,441 acres in 1972 to 3,544 acres in 2000. These figures show the loss of prime agricultural land in the last 28 years and the reduction of land suitable for agricultural production.

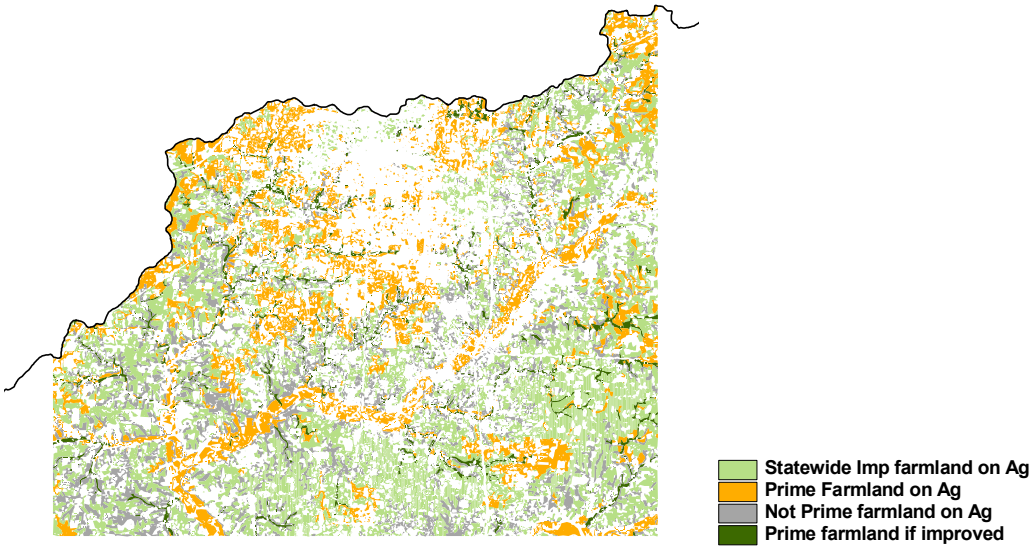


Figure 16. Prime or statewide important soils with cropland or grassland land cover in 1972.

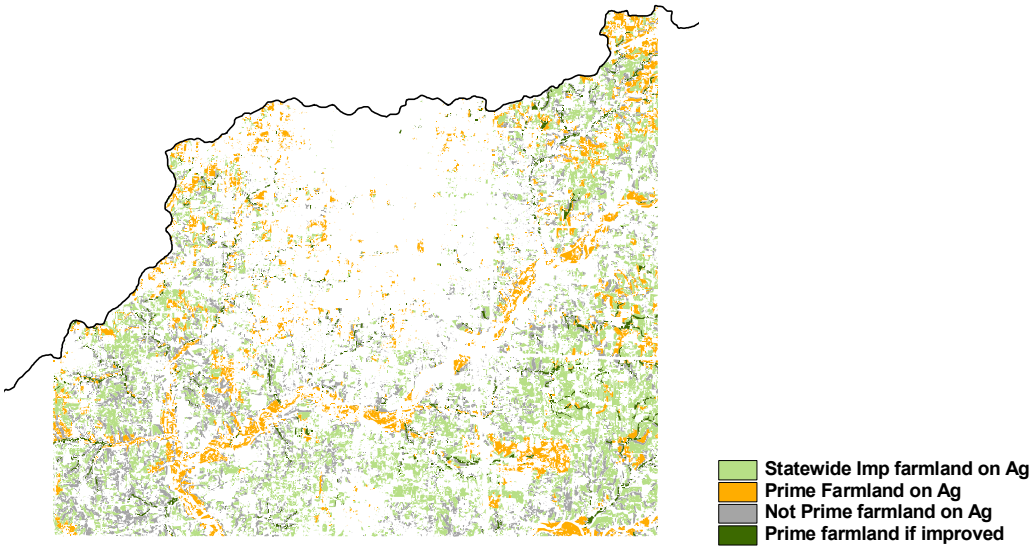


Figure 17. Prime or statewide important soils with cropland or grassland land cover in 2000.

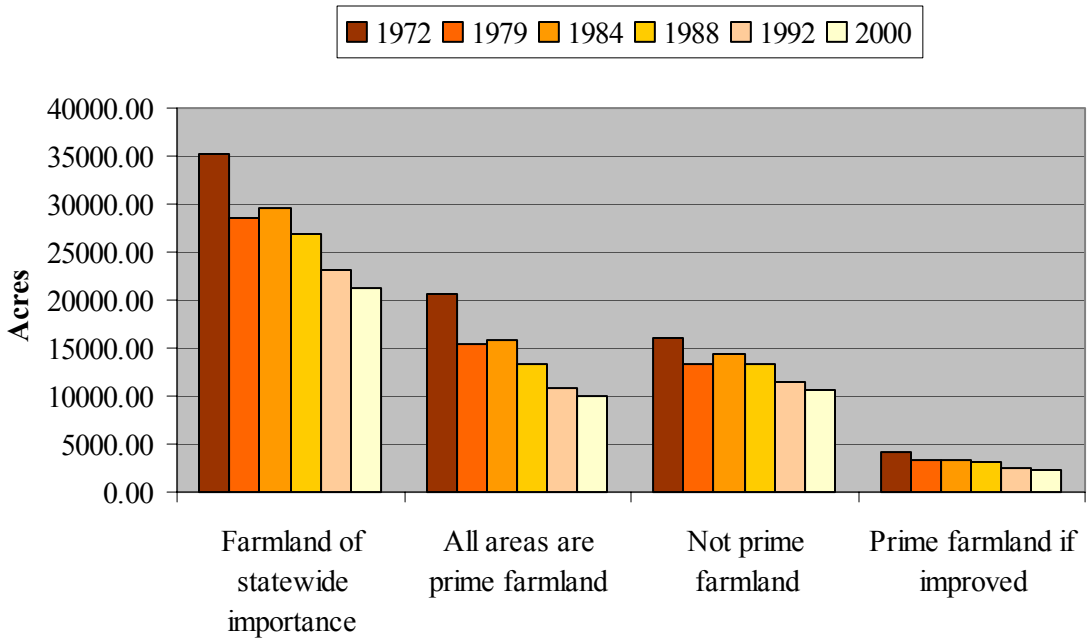


Figure 18. Change in grassland land cover from 1972 to 2000.

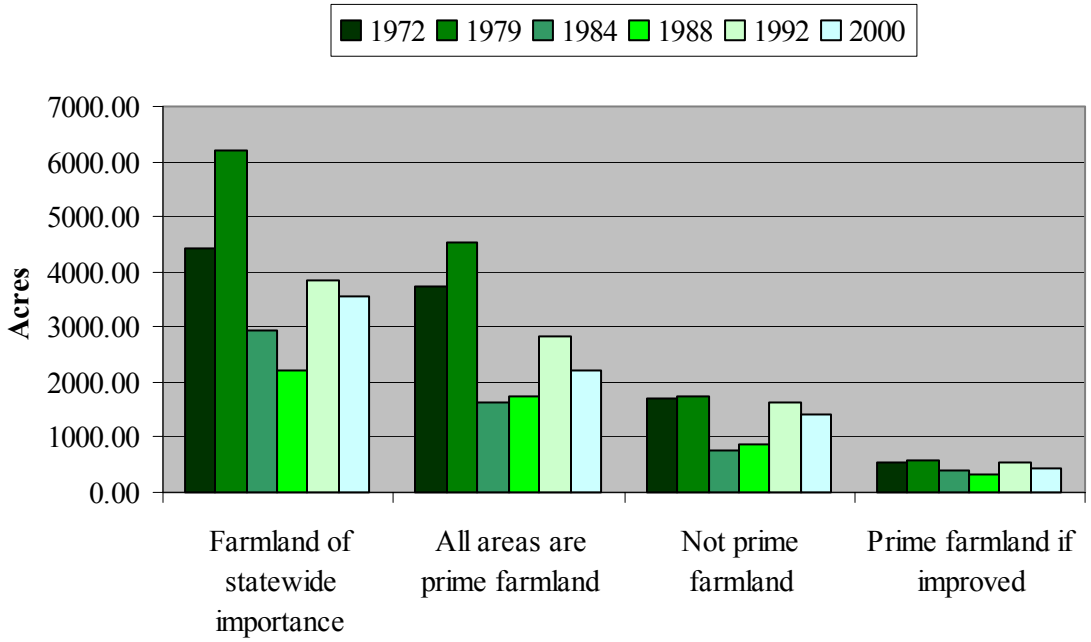


Figure 19. Change in cropland land cover from 1972 to 2000.

Outreach

The final goal of this project was to provide information useful for public education and outreach. JRBP asked MoRAP to develop preliminary canoe guides for the James River. Ultimately JRBP may develop canoe guides to facilitate floats along the James River and educate the public about the river and its ecosystems. MoRAP created a series of maps along the river that identified locations of canoe put-in and take-out points, boat launch areas, restroom facilities, and other features of interest (Appendix E). These maps, or improved versions, may ultimately be used when JRBP creates a James River canoe guide.

In addition to developing maps, MoRAP worked to share data and analyses from this project. A June 2003 meeting was held in Springfield to share the results with interested parties. A list of data was distributed for groups to select data of interest for delivery (Appendix D). The data and information will be copied to CDs and distributed to the groups. In this regard it is hoped that information can be shared among all entities in the basin to facilitate outreach and education.

Discussion

The James River Basin Partnership called together a group of interested parties to discuss information and data that was of primary interest in the basin. Armed with this input and the original grant guidelines information such as urban expansion, conservation opportunity areas, agricultural resources, and outreach materials were developed.

Further analysis could provide more information to the stakeholders in the basin. For example, the one-half and one mile buffer placed around urban areas identifies potential focal areas for forest, grass, and agricultural conservation. However, since urbanization does not occur in a perfectly even pattern the buffer is limited in its analysis. In addition to the rate of growth, the direction of the growth is an important factor in predicting future urbanization patterns.

References

Diamond, D.D. and C.L. Blodgett. 2003. Urban Remote Sensing for Land Use Changes and Impacts. U.S. Environmental Protection Agency, Region 7, Kansas City, Mo. 39pp.

Diamond, D.D., T.M. Gordon, C.D. True, and R.D. Lea. 2001. An Ecoregion-based Conservation Assessment for EPA Region 7: Iowa, Kansas, Nebraska, and Missouri. U.S. Environmental Protection Agency, Region 7, Kansas City, Mo. 37pp. + 10 appendices.

Diamond, D.D., T.M. Gordon, C.D. True, R.D. Lea and W.E. Foster. 2003. An Ecoregion-based Conservation Assessment and Conservation Opportunity Area Inventory for the Lower Midwestern USA. Natural Areas Journal 23: 129-140.

McGarigal, K. and B.J. Marks. 1995. FRAGSTATS: spatial pattern analysis program for quantifying landscape structure. Gen. Tech. Rep. PNW-GTR-351. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

NRCS Manual 440: Conservation Programs, Part 523 Farmland Protection Policy Act, Subpart C Important Farmland Soils

Appendix A

July 16, 2002
Notes from JRBP meeting

Present: Diana Sheridan, Walt Foster, Julie Barr, David Diamond, Taisia Gordon, Robbyn Abbitt

Notes

Watershed Planning Meetings
--Key focus here is developing a comprehensive watershed plan
Diana is working with Shawn Grindstaff – he is with a forest planning consulting group (Forester Group) that has worked on facilitating meeting to find solutions – especially related to superfund sites

They have a process in place that they want to get done in 12 months or so:
1. interview stakeholders to ID issues and focus areas
2. have key people (deligates for each stakeholder group; 20-30 total) attend planning meetings ("summits") after the interviews
3. have a limited group get together to identify problems, set priorities and complete a watershed planning action plan

Diana says we might come in either after or before this project is done. Local groups are paying – no grants have been received.

Four groups are mainly involved within the JRB area in this project:

1. Watersehd Committee of the Ozarks – Loring Bullard – mainly N of Springfield and N of watershed and related to water supply for city

2. White River Basin Foundation – based on Branson this group has a lot of funding and wants to do the things in the whole White River Drainage; their guy is Floyd Gilzow

3. Table Rock Lake Water Quality Inc – Kimberling City – mainly focused on septic systems around the lake and how to do better water treatment – they have a 2 million grant to try out some innovative sewage treatment methods

4. JRBP -- trying to get people to not fertilize their lawns is big for Diane, as is the septic tank issue, especially maintenance, whereas the Kimberling City group wants to replace septics with better sewage treatment methods

Other JRBP Current Projects
319 Money

This money is basically going toward farming best management practices
Also, ag restoration (e.g., well plugging, riparian plantings)
Farmland Protection Act Money
With Dee Dee Vest (sp?) from NRCS
Asked for $500,000 this year
Looking for areas where they can purchase development rights (deed restrictions for 30 years or indefinitely)
--Potential for MoRAP to help: Identify farmland on streams and on slopes

Major issues for James River Basin
Septic systems (# of septic tanks, % of septic systems that contribute to non-point source pollution, education of new septic tank owners)

- Fishing (as related to recreation & tourism; Bass Pro)
- Endangered, endemic, and/or unique aquatic and terrestrial species (maybe not much of an issue to them)
- Agricultural/Poultry issues (preserving prime farmland, controlling ag-related nonpoint source pollution)
- TMDL planning process

<u>Sources and contacts for MoRAP</u>

- 15yr old Taney Lake project (EPA)
- Septic systems (old data from EPA?)
- CRP and WRP sites and people
- Karst topography
- P loading and hotspots (Liz Cook/Terry Barney – NRCS)
- P stored/trapped in sediment along James; sample points and data (Bob Pavlosky – SMSU)
- TMDL models (John Hoke – DNR) Diana didn't seem to like these models, can we help with this?
- Bird survey data and other concerns (Jane Fitzgerald – ABC)
- Fisheries (Chris Vitello – MDC)
- Platte data in GIS? (Springfield GIS)
- Greenways and trail network
    - Springfield/Greene County Park Board
    - Ozark Greenways, Terry Weigley
        - Park tax has provided $ for land acquisition
        - Purchased an oxbow and farm for the parks dept
    - Springfield GIS
    - Stone County
        - Silver Dollar City
        - City of Branson
- Prairie groups (Master Gardner)
- Land acquisition for park system (Green Co.)
- Farmland Protection / farmland development rights (DeeDee Best – NRCS)

- Land acquisition for Wilson's Creek National Battlefield (Gary Sullivan is an assistant there)
    - Their 10yr plan is currently out for review (on NPS website)
    - Question of do they now focus on purchasing more land for wildlife
    - Need to retain "out of the way" aspect of the battlefield
- Watershed Planning/Summit Committee (Watershed Committee of the Ozarks, White River Basin Foundation, Table Rock Water Quality Inc., JRBP)

Tasks

Contact key people about issues (through an August meeting that Diana will arrange)

- Gather preliminary data for August meeting
    - Opportunity Areas and ranking (a similar version could be applied within city limits – identify green space and rank based on specific interests)
    - Identify rare and threatened aquatic and terrestrial species
    - Baseline data (most up-to-date public lands, crp, wrp, sinks coverage)
    - Assessment data (ag on steep slopes, road density / density shift using TIGER data)

Appendix B

James River Basin Data Development/Delivery Meeting Notes
The Bank, Springfield, MO
Thursday, September 26, 2002

Attendees:
James River Basin Partnership
Diana Sheridan
Bobby Wixon

Wilson's Creek National Battlefield (National Park Service)
Richard Lusardi
Lisa Thumas

Green County GIS
Kent Morris
Tom Dyer
Jim Wolgamuth

City of Springfield GIS
Wendell Farrand

USDA-NRCS (Urban Conservation/Farmland Protection Act)
DeDe Vest

US EPA Region 7
Walt Foster
Julie Barr

Missouri Resource Assessment Partnership
Taisia Gordon
Robbyn Abbitt
David Diamond

Greene County & City of Springflied
Very interested in Melissa's urban change data
Have used buffering city services data layers as an "estimate" for septic system numbers
Buffered city services 200 feet, assumed those outside of this buffer were not on city services, and thus on septic
The have an "old" Environmental/Natural Resource Inventory – There was discussion of us updating this dataset—We need to get this – it is digital we think – get from Kent.
This is one of the very important delivery products we could create for Greene County and will serve as one of our focus delivery points/products.

This county has the most developed GIS data and personnel – other counties have CAD files only
Proposed working with Stream Teams to determine what types of data and in what formats would help them most and provide greatest public education
The greatest threat of development is within the city service area – this is an important data layer to get from someone, perhaps Wendell, because the threat of loss of statewide important farmland and other features is greatest here --- other cities may also have city service areas delineations and we might should try to get these for all of the major cities.

It looks like this project will be primarily focused on Greene County (given amount of data available) and then it will be used to show other counties how it was done, and how the project helped the agencies in the counties.

Other Counties
We need to contact the other counties to see what types of data they have available
Webster
Lawrence
Christian
Douglas
Stone
Barry

NRCS/Agriculture:
Prime Farmland = Federal designation based solely on soil type (there is not much of this in MO)
There is a field in SSURGO that designates Prime Farmland soil types.
State Important Farmland = State designation that identifies important soil types in the State of MO based upon comparison within the state
We need to get this data set; see if SSURGO is available for all of this area and if there is a data attribute for statewide important farm lands – Liz Cook would know and might in fact have already pulled this together for their Phosphorus model for this watershed.
SALT (Specialized Area Land Treatments) and EQIP programs
Discussion of developing data that could be used to set priorities for properties chosen to participate in the SALT program --- this could serve as a second key delivery product and point of contact for us in the JRB.
e.g., Steep Slope
Unique Aquatic Habitat
Grassland
Nonforested streams (to address riparian buffer needs)
Farmland/Greenspace Protection
Do a reverse "OA analysis" to identify at-risk greenspace
Look at quality farmland (soil), proximity to other farmland, and adjacent urban development pressure
Identify these areas as at-risk farmland/greenspaces

city service areas circumscribe areas of very high risk, and other variables can be added to a risk model; has Walt developed variables that could be applied here?

Park Service:
Lisa spoke about a current project with the Univ. of Nebraska that is documenting change in and around the Wilson's Creek Nat'l. Battlefield
Using B/W photos and DOQs in a 3 mile radius around park to look at
loss of natural and semi-natural land
fragementation
Wilson's Creek
100% of dicharge in fall comes from Springfield waste water treatment plant
City of Republica sewer lines are also discharging into the creek via Skanks Branch
Richard feels it is best to look at this area as its own watershed given this scenario (about 1700 acres)
They are currently looking at surrounding properties pertinent to preserving the historic battlefield as well as for greenways (319 funds?)
They have found a blind crayfish in a cave in the park—indicator of a "healthy" system?
Park is a unique portion of the watershed
Amount of data
Size
Stewardship
Richard feels that if you can show positive results in this small watershed, then that should be able to translate into positive results if the same strategies are used in the larger watershed outside of the park
It seems like all of the participants wanted some focus on the special needs of Wilson Creek

Springs/Sinks/Caves data
Lisa mentioned possibly using springs data to identify areas for livestock fencing
Interest in the sinks data—Avaliable in January? Jeff Schloss will know about this
Greene Co. does have their own sink data that they used to augment USGS sink data—we should get this and see by what % the USGS data is off

Non-Point Pollution
P runoff has already been modeled (DNR) – also, Liz helped develop a model that identifies areas that are higher risk for P run-off and we need to get that model
We could identify risk factors and where those risk factors are located (e.g. streams on steep slopes near ag land or erodable soil) – see above comment on the existing NRCS model in this regard
Then others could use this data to set up monitoring programs
City of Springfield does have a septic system digital data layer (Wendell is going to send us a list of data they have so we can pick and choose what we need)

State and Federal listed species
Battlefield has more up-to-date info than MDC has for species within its border; they would like access to the Heritage data and we can help them make those contacts.
We should create a "species of interest" list for the project and then we can focus on their locations/ranges when gathering and developing data

Recreation/Tourism
JRBP is now creating a field guide for the James River Basin – a canoe guide; we could provide very important information for this brochure – help characterize the watershed and the streams and identify important areas – could become one more focus for a delivery product (e.g. help with information and graphics for that brochure - -we need to be certain to coordinate on this because the brochure is due to be done next spring so we need to know who is coordinating the production of this and provide data and graphics. Diana will let us know what information she would like for us to provide??? is this right??
This seems like a very promising opportunity
Grant for this comes up in the spring – is the brochure due to be produced in the spring? Need more specifics?

Preservation of Historic Sites
We do not have these data
Located at the State Historical Society in Columbia
Data is protected from public requests
They have never given data out upon request from MoRAP
Make another attempt?
Richard says that the person to contact is Judith Deel if we want the State Historic sites – we need to do this – Melissa might be the one to try to do this because of the need for these data to up-date the public lands stewardship data – certainly MoDOT would also like these data. We need to email Richard to get this contact information.

Pubic Education:
Show people where the watersheds are
List the stream characteristics in their watershed
Show how many miles of each stream/stream type there are
List what species are in these streams
"Get to know your watershed" – such a brochure could serve as a key delivery product and might be combined with JRBP's effort to help 4th graders learn more about their watershed
Also use with City of Springfield Utilities Ed Program – contact Wendell more to see if a product of some sort could be created
Show people which streams their properties drain into, etc.

Data Delivery:
ArcView Project
ArcView Viewer Project
ArcIMS
We should contact Rex Camack at SMS
His research interest is how to make GIS available to the public
We could also use SMS as a data archive and possibly to serve IMS

What's next?
DeDe is going to start a list of data/projects that are priorities for NRCS
The others in attendance will add to this list and give it to MoRAP
MoRAP needs to evaluate these notes and those that are to come from DeDe and others and then create a list of deliverable products – do some preliminary investigatings – and then meet again with EPA and the other partner end users in the the JRBP

Appendix C

James River Basin Data Development/Delivery Meeting Notes
The Bank, Springfield, MO
Thursday, June 26, 2003

Attendees:
James River Basin Partnership
Diana Sheridan
Bobby Wixon
Teri Hacker

Wilson's Creek National Battlefield (National Park Service)
Gareth Rowell

Green County GIS
Kent Morris
Tom Dyer
Jim Wolgamuth

Stone County
Ray Jones

City of Springfield GIS
Wendell Farrand

USDA-NRCS
DeDe Vest
Steve Wilson

Watershed Committee of the Ozarks
Loring Bullard

Upper White River Basin Foundation
Floyd Gilzow

US EPA Region 7
Walt Foster
Jim Clemenson (Springfield)

Missouri Resource Assessment Partnership
Taisia Go**rdon**
Robbyn Abbitt
Melissa Lanclos

This meeting presented the results of the project and discussed methods of data delivery. Please see the final report for project results. See attached documents for data delivery documentation.

Appendix D

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List of data and analyses developed at MoRAP:

☒ 1972, 1974, 1984, 1988, 1992, 2000 classified land cover of Springfield metro area (ArcGRID format)

☒ 2000 – 2001 15-class land cover (DRAFT Grid)

☒ Forest, grassland, and mosaic distance-from-edge grids (Grids)

☐ Roads distance-from-edge grid (Grid)

☒ Forest, grassland, and mosaic opportunity areas (Grids)

☒ Agricultural land (crop and grass) merged with prime and statewide important soils (Grid)

☒ Metro areas created from lights-at-night and census data (AV Shapefile)

☐ National Hydrography Dataset (1:24,000 stream network) including streams and waterbodies (Arc Coverages)

☒ Powerpoint presentation

Data in-house and/or refined at MoRAP:

☐ 1990 U.S. Census Bureau population by block group (AV Shapefile)

☐ 2000 U.S. Census Bureau population by block group (AV Shapefile)

☐ 2000 U.S. Census Bureau TIGER roads (Grid)

☐ SSURGO II data (Counties: Barry, Christian, Greene, Lawrence, Webster)

☐ SSURGO II soils merged by Prime and Statewide Important Farmland designations (Grid)

☐ 30 meter digital elevation model

☐ 8-, 10-, and 12-digit Hydrologic Units (AV Shapefile)

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☒ EPA project mask

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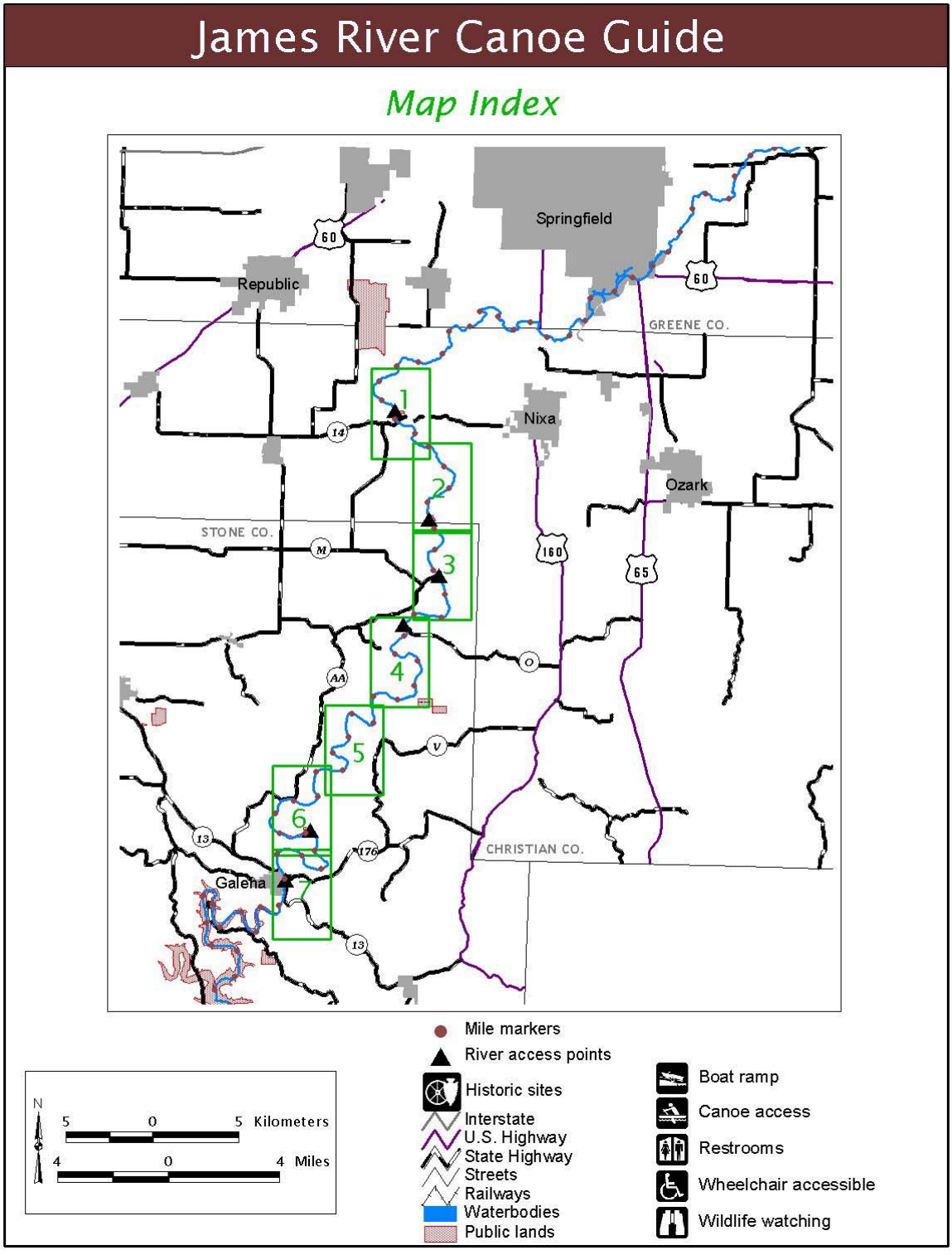
Appendix E


James River Canoe Guide
Map Index
Springfield
Republic
Nixa
Ozark
GREENE CO.
STONE CO.
CHRISTIAN CO.
Galena
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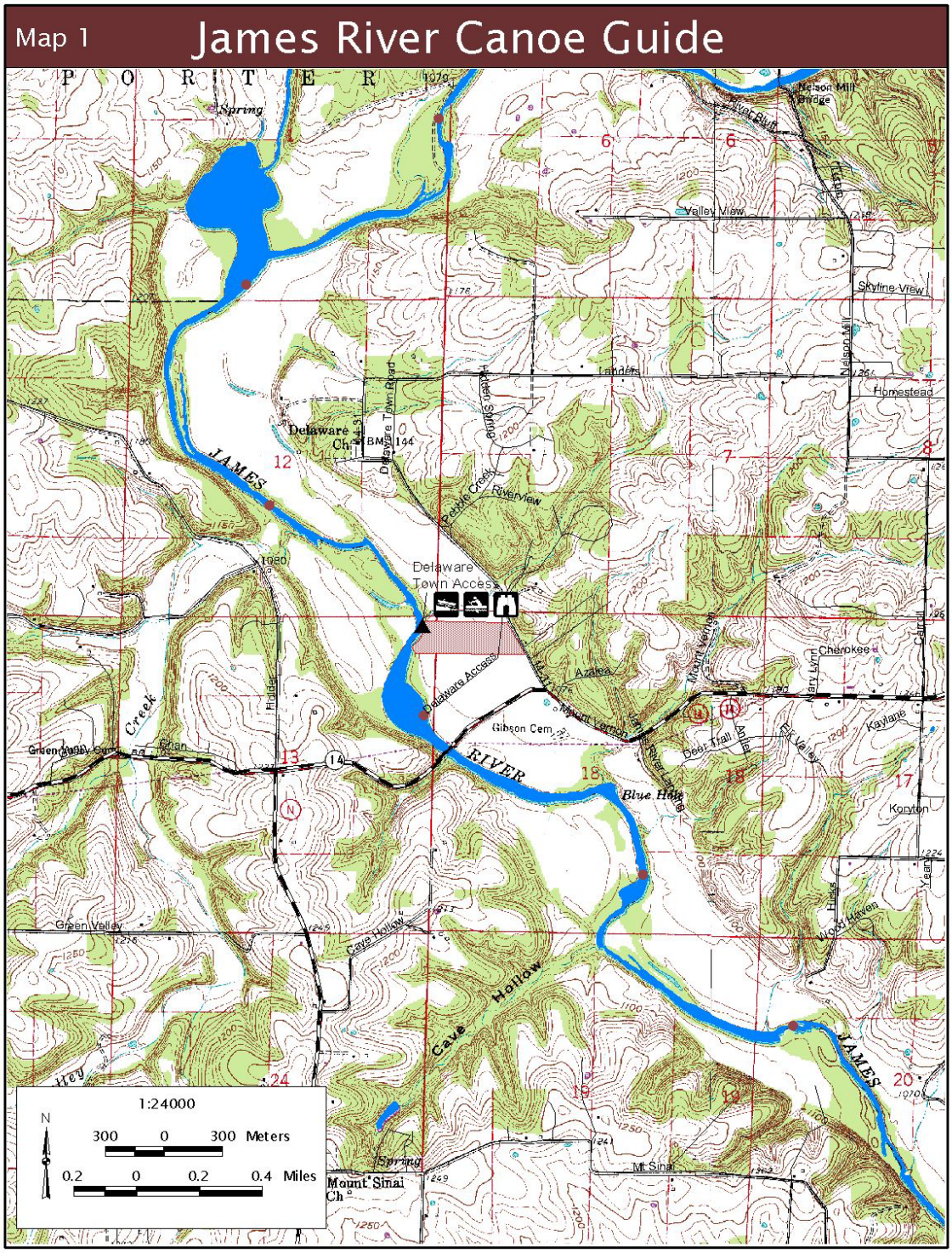
River access points
Historic sites
Interstate
U.S. Highway
State Highway
Streets
Railways
Waterbodies
Public lands
Boat ramp
Canoe access
Restrooms
Wheelchair accessible
Wildlife watching


Map 1
James River Canoe Guide
P O R T E R
Spring
Nelson Mill Lodge
River Bluffs
Valley View
Skyline View
Nelson Mill
Homestead
Landers
Delaware Ch
BM 1144
Delaware Town Road
Hidden Spring
JAMES
Pebble Creek
RiverView
Delaware Town Access
Delaware Access
Azalea
Mount Vernon
Mount Vernon
Cherokee
Mary Lynn
Carroll
Kaylane
Deer Trail
Blue Hole
RIVER
Gibson Cem
Creek
Green Valley
Green Valley
Cave Hollow
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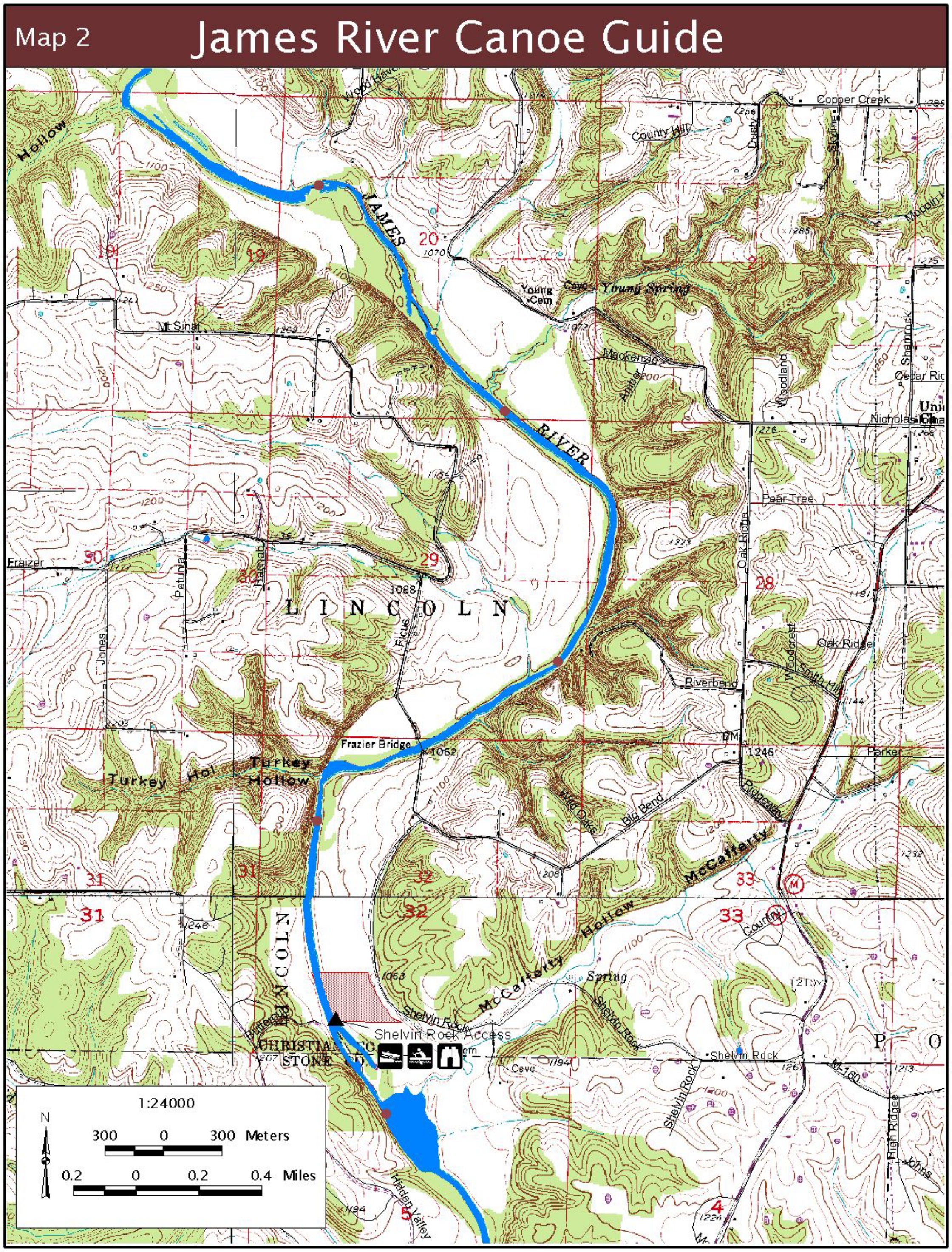

Map 2
James River Canoe Guide
JAMES
RIVER
LINCOLN
Turkey Hollow
Frazier Bridge
Shelvin Rock Access
McCafferty Hollow
Young Spring
Copper Creek
Oak Ridge
Riverbend
Big Bend
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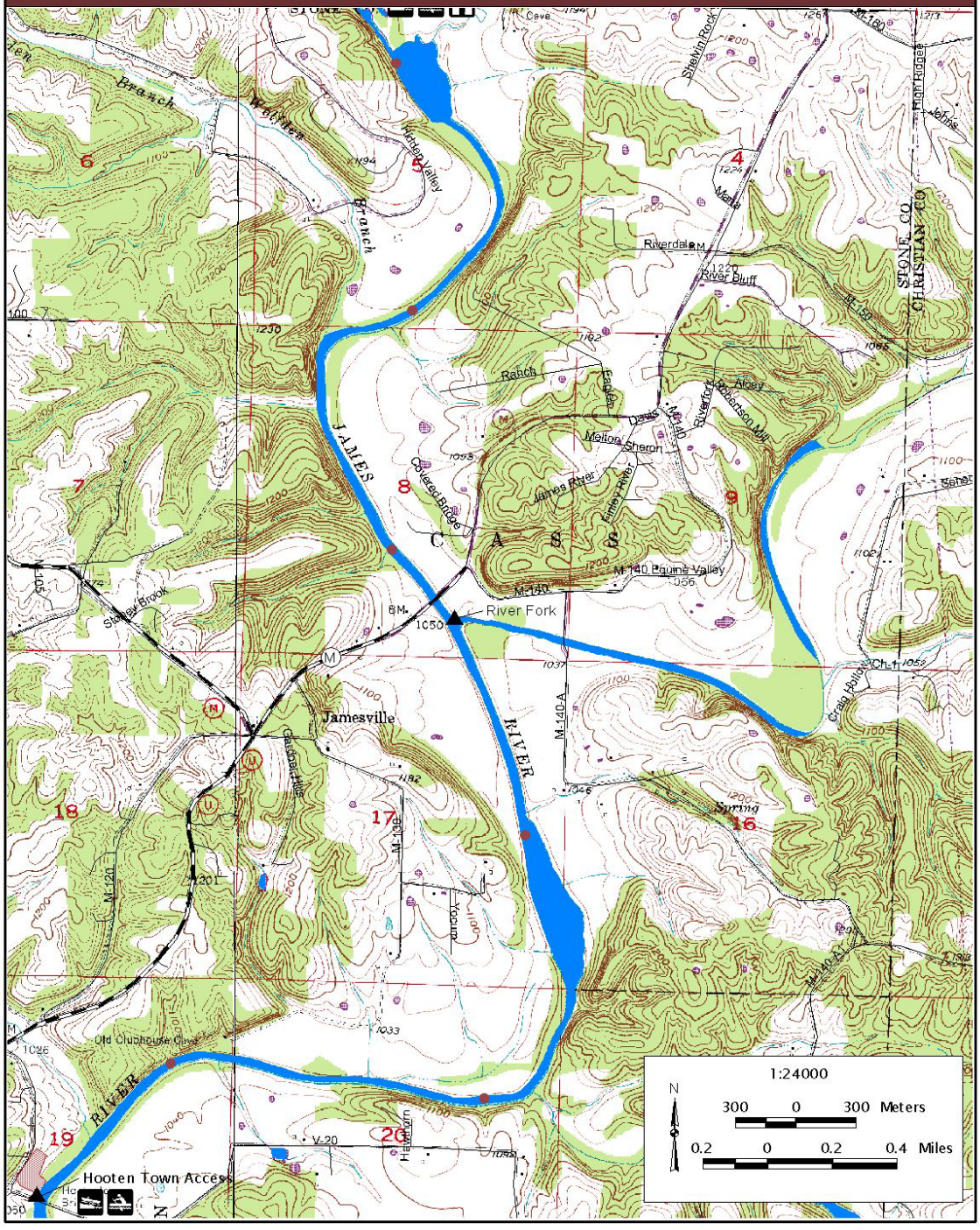
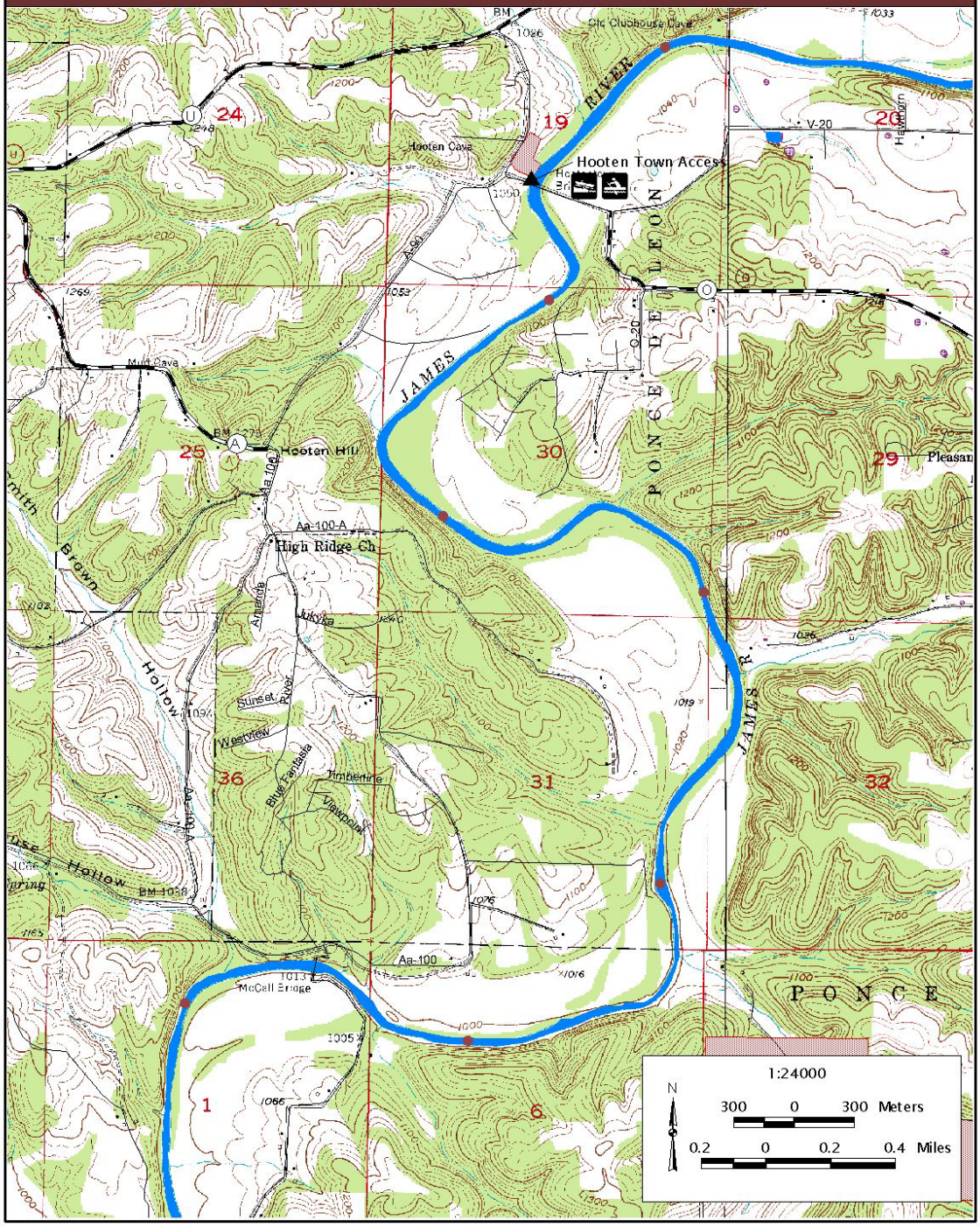
Map 3

James River Canoe Guide



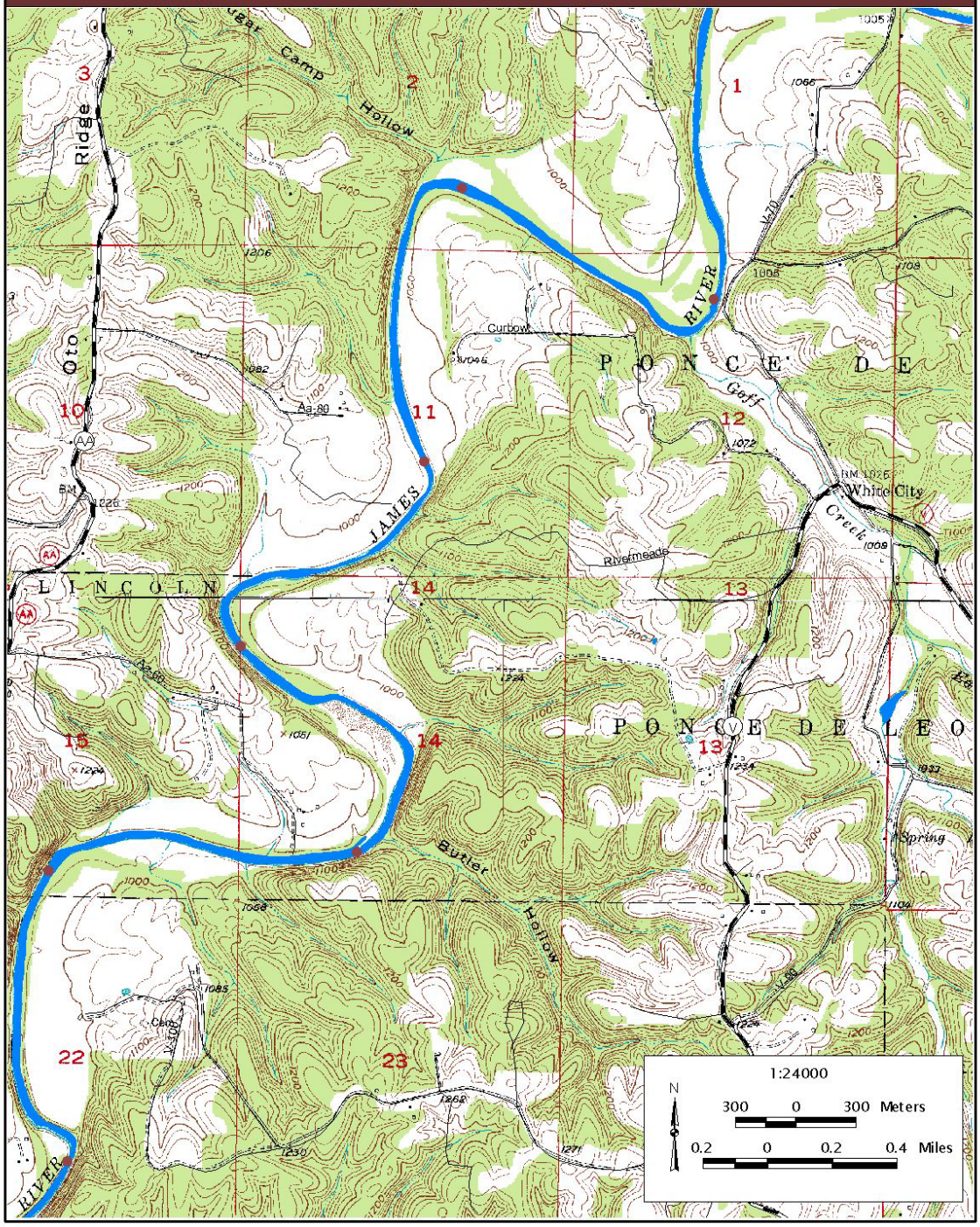
Map 4

James River Canoe Guide



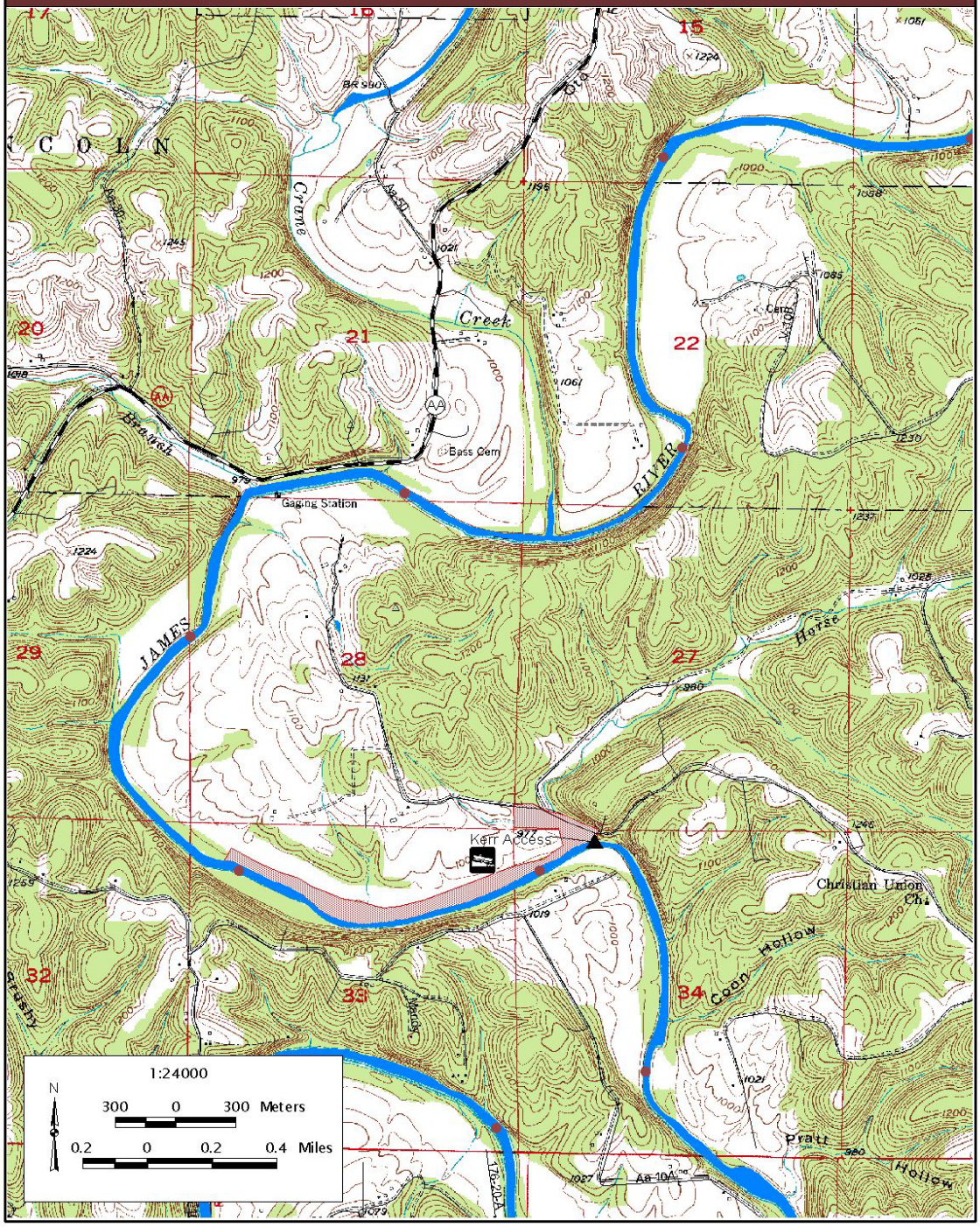
Map 5

James River Canoe Guide



Map 6

James River Canoe Guide



Map 7

James River Canoe Guide